

Globally modified Navier-Stokes equations coupled with the heat equation:existence result and time discrete approximation

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Abstract

We provide in this article an investigation of the globally modied Navier-Stokes problem coupled with the heat equation. After deriving the variational formulation of this problem, we prove the existence and the uniqueness of the solution using the method of Faedo-Galerkin and some compactness results. Next, we propose a time discretization of these equations based on Euler's implicit scheme. We prove the existence of solution with the aid of Brouwer's xed point and study the stability of discrete in time solution by using the energy approach.

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